Psychology

Cyberemotions in the Era of New Media

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The introduction of new media has accelerated changes in the generation and delivery of information. Cyberemotions, as a new type of public opinion, can be more contagious and propagate in more diverse ways than traditional public sentiments. The emotions of internet users have a rising influence on the progression of recent significant social events. In order to spark additional discussion on online sentiment modulation and online public opinion tracking, this article presented an overview of cyberemotions definition and key analytical methodologies in existing online sentiment research, as well as a synopsis of major components of cyberemotions.

Keywords: Cyberemotions; The Era of New Media; Online Emotion Regulation

THE popularity of the internet has drastically altered human lifestyles, particularly communication patterns. Internet communication not only spreads facts but also elicits emotional responses. In the age of new media, internet emotions can spread quickly via Microblog, WeChat, Zhihu, Tiktok, Kwai, and other social media, resulting in exponential transmission and becoming an amplifier of social sentiments. Furthermore, bad internet emotion experiences can have a long-term impact on people's emotions in real life and offline actions. With its convenience and anonymity, the internet provides everyone with a large platform to communicate their thoughts and feelings. Participants on internet forums, which are less bound by societal standards, can express their emotions more quickly and frequently (1). Individual or group feelings can quickly become collective sentiments when internet events occur due to simple access to the internet (2).

Cyberemotional research is a relatively young field that integrates the study of emotions with internet technology. Many fields, including computer science, public communication, and others, have explored the topic to varied degrees. Researchers use emotional data that has been extracted to forecast changes in emotions in cyberspace. The emotional reactions of the public can be successfully reflected on the internet. China has 1.067 billion internet users and a 75.6% internet penetration rate, according to the 51st Statistical Report on China's Internet Growth; the proportion of young people using the internet is rising, but their access to education online is inadequate (3). Thus, it is crucial to carry out additional studies on ways to enhance the safety of the online environment.

Conceptualization of Cyberemotions

Definitions of Cyberemotions

Emotions are complex human experiences that entail both subjective perception and physiological reactions, as well as being constantly influenced by social and cultural settings. The concept of cyberemotions was initially introduced in the EU-funded Large Scale Integrated Project "CYBEREMOTIONS – Collective Emotions in Cyberspace." Its purpose is to comprehend the role of collective emotions in the formation and dissolution of ICT-mediated communities, as well as to lay the groundwork for the future generation of emotionally intelligent ICT services (4). Tang asserted that cyberemotions are a significant component of online public opinion and that they can impact it through network mobilization mechanisms (5). Online emotions, according to Zhang, comprise both active and passive emotional responses of individuals and groups to online social events (6). Kappas emphasized the psychological process of internet users' emotions and referred to cyberemotions as affective processes on social networks involving mediated communications that are influenced by emotional states of individuals and that, in turn, may lead to the elicitation or modulation of emotional states of individuals in networks and, as a result, state changes in e-communities (1). According to Zhou et al., the goal of cyberemotion research is to examine internet phenomena that can reflect the emotional characteristics of individuals or groups; that these phenomena are represented by text, emoticons, audio, and other forms of information; and that collective emotional states can be created and modulated through internet communication (7). Cyberemotions are defined in Xu's study as public manifestations of emotions and opinions in response to stimuli from mobile internet-based platforms, which play a significant role in fostering the creation and evolution of online public opinion (8). In this study, we define cyberemotions as the emotional experiences of internet users based on information exchange via the Web, which encompass both individual emotions expressed online and collective internet feelings evoked by public-interest events.

Approaches to the Characterization of Cyberemotions

There have been attempts to characterize emotions as points in a two- or three-dimensional space, dating back to Wilhelm Wundt in the nineteenth century and continuing into modern theories (1). To characterize cyberemotions, most researchers in internet feeling studies used the two classical techniques in psychological construction.

The Categorical Approach

Most academics that studied cyberemotions in the setting of the internet adopted this strategy in an effort to group them into a number of distinct but related categories. Many types of internet events elicit varied responses from people. Online attitudes, for instance, can be classified as approbation, disapproval, abuse, provocation, neutrality, digression, vacillation, etc. in political forums (9). Tang categorized online emotional reactions to emergency situations into six categories: anger, sarcasm, disappointment, pity, mistrust, and pro-government (5). Based on more than 20,000 pieces of data collected from microblogs and focusing on moral events relevant to the public good, Ye et al.

discovered five common emotions among internet users, including anger, contempt, disgust, pity, and love (10).

The Dimension Approach

The dimension approach views emotions as a continuum and contends that it is difficult to determine when a particular emotion separates from other emotions (11). The models that researchers who support this strategy most frequently use are two-dimensional. The valence-arousal model is one common illustration (12). For instance, the well-known "Missing Hu" incident in Shangrao City, Jiangxi Province, in 2022 was marked by intense levels of engagement and arousal online. Internet users' emotions were affected by a number of comments made in response to this incident, proving that arousal is a key element in the evolution of social communication behavior. The positive-negative emotion model (13), which has been used to categorize online emotional responses into positive and negative feelings, is another widely used example. For instance, during lockdowns brought on by the COVID-19 epidemic, college students' online attitudes change over time and are directly tied to the appearance of events related to the epidemic. These changes include both good and negative emotions. However, some ideas and comments shared on social media may be objectively true or lack strong emotional undertones. As a result, the study of cyber sentiment has developed a three-dimensional model of emotions that includes positive, negative, and neutral feelings (14).

Categories of Cyberemotions

Internet User Emotions versus Digital Media Sentiment

Internet user emotions are those feelings that regular internet users have while interacting with others and sharing information online. The user uses social media platforms to express their emotions by leaving comments, forwarding posts, providing likes, sharing, etc. and is subsequently influenced by the online emotional displays of other users. Because different age groups use the internet for different things, they express their feelings differently. The affective displays of the middle-aged group are often more reserved, and their feelings are more constant. Younger internet users, in contrast, tend to have simpler emotions that are frequently expressed in humorous and exaggerated ways. Younger age groups are more prone to express their emotions publicly and to be swayed by popular online opinions. Strong emotional responses like worry, resentment, and frustration are all possible among them.

Digital media sentiments refer to those opinions based on emotions that are disseminated to the public through new media. Digital media sentiments cover any digital means or channels of general communication, information, or enjoyment in society, including self-media. New media dominate conventional ones by a wide margin in the internet era. Unfortunately, it is challenging to regulate the vast amount of information spread through new media in online mass communication, and occasionally material just flows to the public without being verified. Some new media channels disregard the impartiality of news reporting and purposefully spread misleading or sensational material to capture audiences' attention. Internet users' emotions

can be greatly and strongly impacted by media sentiment, which has the potential to distort public opinion. At the same time, new media run the risk of overexposing audiences to the emotional stimulation of social events by relentlessly pushing vast amounts of dramatic material. They will eventually become less emotionally receptive, and social apathy may develop in them.

Online Individual Emotions versus Group Emotions

The patterns of human social life have undergone major alteration as a result of the virtual world on the internet. It's a vital part of some people's daily lives to express their emotions through chat rooms, blogs, BBSs, WeChat, and online games. People participate in online events for a variety of reasons, such as curiosities, collective thinking, and self-representation. People are more eager to express themselves online in the hopes of winning the approval and respect of others. They are more driven to communicate their emotions when their opinions coincide with those of others, displaying an "expression for recognition" mentality (15).

Individuals experience group emotions when they identify with a social group, thereby incorporating the group into their psychological selves, according to Smith and coworkers. In addition, they identified four key characteristics that define group-level emotions: being distinct from the individual's personal-level emotions; being dependent on the individual's degree of group identification; being socially shared within a group; and contributing to the regulation of intragroup and intergroup attitudes and behaviors (16). Individuals become more selective in their information acquisition on the Internet, and those with similar online emotional proclivities form their own group emotions over time (17). Internet users from different social classes will express different attitudes and emotions toward the same social event, especially when confronted with news about major social issues. When they find online a group with similar characteristics to themselves, group identification will reinforce their emotional conformity with the group.

Methods Used in Cyberemotion Research

Text-based Sentiment Analysis

Technologies for automatically extracting emotions have arisen as a result of the need for new tools and technology to handle and evaluate the massive amounts of text in online user comments. Current emotional analysis technologies were divided into three categories by Medhat et al., including lexicon-based solutions, machine learning algorithms, and a combination of the aforementioned two techniques (18).

Lexicon-based analysis, also known as the unsupervised method, relies on the existence of specific symbols such as block capital letters, exclamation points, and emoticons, as well as the emotional language that has been identified. It has been used to analyze the connections between user psychological processes and emotions in a variety of online emotion research in order to forecast users' personalities, levels of subjective happiness, and mental health (19). The Computational Cyber-Psychology Lab of the Institute of Psychology of the Chinese Academy of Sciences has developed "Textmind," a

psychological analysis system in Chinese based on the development of the "linguistic inquiry and word count (LIWC) system," in order to facilitate the analysis of emotions contained in Chinese texts. This is due to the differences in language structure, cultural background, and the peculiarities of emotional expressions shown in Chinese network texts.

Emotional analysis based on machine learning algorithms is considered a supervised technique because it requires pre-annotated text training. As an illustration of a certain emotion, pre-annotated data are used. During the initial training phase, machine learning algorithms attempt to unearth the concealed principles underlying a particular emotion in the text. When such principles are identified, they are used to automatically recognize emotions in unannotated texts. For example, Ye et al. gathered 10,006 microblog posts about the "Man-made Misfortune" incident and created a ratio of 10% training data to 90% test data in order to investigate the emotional characteristics of internet users and distinctions in their emotional responses in the posts (10).

Because Lexicon-based analysis is overly dependent on the lexicon and machine learning algorithms require a large quantity of training data, a significant number of researchers utilize a hybrid of the two approaches to analyze emotional expressions in online texts. Khan et al. argued that this alternative could yield more precise results than either of the two methodologies when used separately (20).

Multimodal Emotion Recognition

Multimodal emotion recognition, which analyzes online emotions using both language and non-language data, has grown in popularity as a research area. Emotion identification benefits more from represented dynamic information than isolated static images because emotional transformation is a continuous temporal process. The first multimodal emotion analysis dataset that integrates visual, audio, and textual modalities was made available by Morency et al. using multimodal emotion identification to analyze visual, audio, and textual data, which advanced the field's study (21). To enhance the performance of multimodal emotion recognition, Wu et al. created a multi-task integrative learning strategy. It is an efficient technique for recognizing video emotions since it is based on hierarchical attention (22).

Cyberemotion Expressions

The anonymity, pervasiveness, and diversity of the internet encourage its users to express opinions and emotions in cyberspace that they might hold back in real life. Cyberemotional expressions occur when individuals or groups discharge their emotions and attitudes through texts, symbols, images, and other forms on the Internet and can be categorized primarily according to the following settings:

Online Emotion Expressions on a Daily Basis

Using online applications such as WeChat, TikTok, Kwai, etc., individuals are able to express their thoughts and sentiments freely and openly about everyday occurrences on the internet and exchange their perspectives with others. Using information from millions of Twitter messages, Golder and Macy identified individual diurnal and seasonal mood rhythms (23). Derks et al.

discovered in their study that individuals are more likely to express their emotions online than offline (24). Tang and Hew emphasized that the automatic recognition of Emojis is a crucial method for analyzing individual differences in online emotional expressions. The majority of internet users use Emojis and emoticons in addition to text to convey emotions in their daily posts, which can be used to compensate for the absence of non-verbal cues in online emotion communication (28).

Emotional Responses to Internet Events
Events on the internet can inspire both positive and negative emotions. Typically, socially charged issues attract the attention of individuals from all aspects of life and spark heated discussions on online platforms. They also provoke greater emotional responses. Surrounding internet events dominated by positive sentiments, the most prevalent emotions are sympathy, empathy, and love, whereas events dominated by negative sentiments activate aggressive and violent tendencies in human nature in the form of mockery, abuse, smears, searching and disclosing private information, etc. (26). However, Zhou et al. asserted that negative emotions frequently dominate the public's response to emergency situations and have the potential to be continuously amplified (7).

Emotional Experiences in Online Shopping
The emotional delight of online shopping is produced by the interaction between the host of livestreaming sales and consumers. Individuals are innately aware of commercial promotion in a real-world situation. Yet, in a network setting, individuals are more likely to be drawn in by giveaways and experience the satisfaction of receiving something for nothing; coupled with a sense of respect from the host, they are more likely to engage in irrational online purchasing. Additionally, the host frequently excels at captivating audiences and maintaining their interest, which piques their desire to watch, participate in, and even compete in the sales. Hence, by manipulating their emotions, the host can successfully encourage their consumption (27).

Cyberemotions Triggered by Online Games
Virtual reality plays a crucial role in the dissemination of the emotions of online enthusiasts. A successful digital game such as Honor of Kings can quickly become a popular pastime among young people, and the collective emotions it arouses can spread quickly and widely. More and more individuals become excessively reliant on the virtual world of online games and are inclined to avoid real life and social interaction, which has negative effects on mental health, social adaptation, academic, and employment outcomes. Xiao and Hou estimated that approximately 10% of Chinese internet users are addicted to the internet (28).

Cyberemotion Regulation
Due to the vast amount of information available on the internet, it is frequently impossible to determine if it is accurate or not. As a result, hot events might cause avalanches of negative feelings and attitudes. An examination of top Twitter events revealed that even popular positive events typically result in rises in negative sentiment strength (4). Relevant research, however, shows that both individual and collective emotional states can be controlled.

Cyberbullying and Emotion Regulation
Teens with insufficient emotion regulation skills are more likely to indulge in problematic internet behaviors such as internet addiction and cyberattacks. With the advent of the internet and communication technologies, cyberbullying has become a pervasive social issue. It has had a significant negative impact on online interpersonal communication. Due to the lack of spatial and temporal constraints in online interaction, cyberbullying can affect a greater number of adolescents and may result in more detrimental psychological effects than traditional bullying (29). As the majority of cyberbullying behaviors occur anonymously and the majority of the bullied remain silent, cyberbullying detection and control become more complicated and difficult than ever before (30). Empathy negatively predicts cyberbullying, according to research (31), and emotional intelligence can be a valuable personal resource that plays an essential protective role in adolescent internet use during times when internet use has been identified as a risk factor for cyberbullying delinquency (32).

"Sang" Culture and Online Emotion Regulation
A popular genre among young Chinese people is "Sang" culture, which is pessimistic. The phrase "sang" is the pronunciation of the Chinese character for "sadness," which has been popular in recent years as a way to describe young people's apathy, low self-motivation, and low workplace morale. The emergence of new media has accelerated the "Sang" sentiment's dissemination. The "Sang" culture was initially thought to be bad, but through time, its beneficial significance came to be understood. Jiang and Li contend that the "Sang" culture is a type of emotional sharing, self-protection, and mental relaxation used by young people as a reaction to life's demands (33). As it is essentially a self-mockery in the face of extreme stress with an aim to release tension, the youth use this self-deprecating expression as a psychological strategy to cope with life's obstacles. One instance of how the internet's widespread use enables users to express common feelings is the rise of the "Sang" culture.

Conclusion
Cyberemotions reflect a variety of social and cultural issues in addition to psychological processes that occur within an individual. They are an essential part of internet public opinion. Positive impacts on people's ability to control their emotions and interpersonal connections can be obtained through rational emotional communication in cyberspace (34). Positive social attitudes have the power to foster among individuals tolerance, cooperation, trust, and a constructive mentality in the age of new media. Those who experience positive emotions tend to be more accepting of opposing viewpoints and better able to coexist peacefully with others. They also tend to be more self-assured and more able to adapt to their surroundings, which enables them to face problems with more courage and optimism.■

References

1. Holyst JA (eds.). Cyberemotions: Collective Emotions in Cyberspace. Springer International Publishing Switzerl. 2017.

2. Bi QL. Online emotion reactions to social events: The role of media framework. Southeast Comm 2019; 2019(6):72-75. DOI: https://doi.org/10.13556/j.cnki.dncb.cn35-1274/j.2019.06.024

3. CNNIC. The 51st Statistical Report on China's Internet Development. China Internet Network Information Center. (2023-03-02). Available at: https://cnnic.cn/NMediaFile/2023/0322/MAIN167945 76367190GBA2HA1KQ.pdf

4. Ahn J, Borowiec A, Buckley K, Cai D, Chmiel A, Czaplicka A, Dąbrowski G, Garas A, Garcia D, Gobron S, Hillmann R, Hołyst J, Kappas A, Küster D, Mitrovic M, Paltoglou G, Pirker H, Rank S, Schweitzer F, Sienkiewicz J, Skowron M, Sobkowicz P, Thalmann D, Thelwall M, Theunis M, Trier M, Tsankova E, Weronski P. CYBEREMOTIONS – Collective Emotions in Cyberspace. Procedia Comput Sci 2011; 7:221-222. DOI: https://doi.org/10.1016/j.procs.2011.09.076

5. Tang C. An empirical study on the evolution of cyber emotions. J Intellig 2012; 31(10):48-52.

6. Zhang M. Research on network sentiment and humanities education of universities. World Scientific Publishing. Proceedings of the 2016 Asia-Pacific English Language Teaching Conference. 2016.

7. Zhou L, Cai L & Liu Y. Cultural differences in cyber sentiments: An analysis of online emotion reactions of the four nations on YouTube to the November 13th Paris Terrorist Attack. J Intellig 2017; 2017(3):61-66.

8. Xu L, Wang QJ. Social and cultural Attributions and factors influencing online emotion expressions in hot sports incidents: A case study of Sun Yang's Doping Penalty in 2020. Sport Sci 2021; 2021(6):103-110. DOI: https://doi.org/10.13598/j.issn1004-4590.2021.06.015

9. Sobkowicz P, Sobkowicz A. Two-year study of emotion and communication patterns in a highly polarized political discussion forum. Soc Sci Comput Rev 2012; 30(4):448-469. DOI: http://dx.doi.org/10.1177/0894439312436512

10. Ye YH, Xu Y, Zhu YJ. The characteristics of internet users' moral emotions at the "man-made misfortune": A study based on big data from Weibo. J Psychol 2016; 48(3):290-304.

11. Le GA, Dong YH, Chen H, Lai KS. Emotion analysis technology for online texts and application. Adv Psychol Sci 2013; 21(10):1711-1719.

12. Russell JA. A circumplex model of affect. Journal of Personality and Social Psychology 1980;39(06):1161-1178. DOI: http://dx.doi.org/10.1037/h0077714

13. Watson D, Tellegen A. Toward a consensual structure of mood. Psychol Bull 1985; 98(2):219-235. DOI: https://doi.org/10.1037/0033-2909.98.2.219

14. Raghavan M, Poongavanam MK, Ramachandran SR, Sridhar R. Emotion and sarcasm identification of posts from Facebook data using a hybrid approach. ICTACT J Soft Comput 2017; 7(2):1427-1435. DOI: http://doi.org/10.21917/ijsc.2017.0197

15. Lu H. An analysis of online emotional communication. News Window 2018; 2018(4):67

16. Smith ER, Seger CR, Mackie DM. Can emotions be truly group level? Evidence regarding four conceptual criteria. J Personal Soc Psychol 2007;93(3):431-446. DOI: https://doi.org/10.1037/0022-3514.93.3.431

17. Wang Y. A brief analysis of the polarization of online groups. News World 2011; 2011(6):100-101.

18. Medhat W, Hassan A, Korashy H. Sentiment analysis algorithms and applications: A survey. Ain Shams Eng J 2014; 2014(5):1093-1113. DOI: https://doi.org/10.1016/j.asej.2014.04.011

19. Zhao N, Jiao D, Bai S, Zhu T. Evaluating the validity of simplified Chinese version of LIWC in detecting psychological expressions in short texts on social network services. Plos One 2016; 11(6):1-15.

20. Khan FH, Bashir S, Qamar U. TOM: Twitter opinion mining framework using hybrid classification scheme. Decis Support Syst 2014; 57:245-257.

21. Morency LP, Mihalcea R, Doshi P. Towards Multimodal Sentiment Analysis: Harvesting Opinions from the Web. Proceedings of International Conference on Multimodal Interfaces. 2011.

22. Wu LQ, Zhang D, Li SS, Chen Y. A multimodal emotion recognition approach based on multitask learning. Computer Science 2019; 2019(11):284-290.

23. Golder SA, Macy MW. Diurnal and season mood vary with work, sleep, and daylength across diverse cultures. Science 2011; 333(6051):1878-1881. DOI: https://doi.org/10.1126/science.1202775

24. Derks D, Fischer AH, Bos AER. The role of emotion in computer-mediated communication: A review. Comput Human Behav 2007; 24(3)766-785. DOI: https://doi.org/10.1016/j.chb.2007.04.004

25. Tang Y, Hew K. Emoticon, emoji, and sticker use in computer-mediated communications: Understanding its communicative function, impact, user behavior, and motive. Educational Communications and Technology Yearbook 2018. pp.191-201.

26. Ahmad T, Ramsay A, Ahmed H. Detecting emotions in English and Arabic tweets. Information 2019; 10(3):98-118. DOI: https://doi.org/10.3390/info10030098

27. Xu YT, Lin Y. The mechanism of live streaming marketing for driving consumer behavior: A new perspective of immersive communication, physical media, and emotional involvement. Fujian Tribune, 2021; 2021(12):111-117.

28. Xiao W, Hou JQ. The relationship between emotional intelligence and internet addiction among vocational college students: The mediating effect of social support. Chin J Special Educ 2017; 2017(10):56-62.

29. Slonje R, Smith PK, Frisén A. The nature of

cyberbullying, and strategies for prevention. Comput Human Behav 2013; 29(1):26-32. DOI: https://doi.org/10.1016/j.chb.2012.05.024

30. Feng JJ. Cyber bullying and prevention education. Res Educ Develop 2018; 38(12):49-54.

31. Fu TT, Li P, Ye T. Empathy and cyberbullying: A chain mediation model. Psychology: Techniq Applic 2020; 2020(02):104-113.

32. Yudes C, Rey L, Extremera N. The moderating effect of emotional intelligence on problematic internet use and cyberbullying perpetration among adolescents: Gender differences. Psychol Rep 2022;125(6):2902-2921. DOI: https://doi.org/10.1177/00332941211031792

33. Jiang JG, Li YX. Online emotion expressions and guidance on values: Reflections on "Sang" culture. Changbai J 2018; 2018(6):143-151.

34. Wood MA, Bukowski WM, Lis E. The digital self: How social media serves as a setting that shapes youth's emotional experiences. Adol Res Rev 2016; 1(2):163-173. DOI: https://doi.org/10.1007/S40894-015-0014-8